C6835
Log Data Report

Borehole Information:

Borehole:	C6835		Site:	216-S-1 & 2 Crib	
Coordinates (WA St Plane)		GWL[1] (ft):	None	GWL Date:	None
North (m)	East (m)	Drill Date	TOC[2] Elevation	Total Depth (ft)	Type
Unknown	Unknown	07/21/08	Unknown	45	Percussion

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	2.0	7	5 7/8	9/16	2.0	44.5

Borehole Notes:

A logging engineer measured casing diameter employing a steel tape and rounding to the nearest 1/16-in. The zero reference is the ground surface.

Logging Equipment Information:

Logging System:	Gamma 1 N		Type: / Serial No.:	60% HPGe / H45TP22010A
Effective Calibration Date:	03/28/08	Calibration Reference:	HGLP-CC-031	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

Logging System:	Gamma 1 C		Type: / Serial No.:	Planar HPGe / 39A314
Effective Calibration Date:	11/22/07	Calibration Reference:	HGLP-CC-024	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

Logging System:	Gamma 1 M with AmBe source		Type: / Serial No.:	NMLS / H340207279
Effective Calibration Date:	05/06/08	Calibration Reference:	HGLP-CC-032	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

Logging System:	Gamma 1 M without AmBe source		Type: / Serial No.:	PNLS / H340207279
Effective Calibration Date:	Not required	Calibration Reference:	Not required	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat			
Date	07/24/08	07/24/08			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	0.0	20.0			
Finish Depth (ft)	32.0	25.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			

Log Run	1	2 Repeat			
MSA Interval (ft)	1.0	1.0			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AN096CAB	AN096CAB			
Start File	AN096000	AN096033			
Finish File	AN096032	AN096038			
Post-Verification	AN096CAA	AN096CAA			
Depth Return Error (in.)	N/A	0			
Comments	No fine gain adjustment made.	No fine gain adjustment made.			

High Rate Logging System (HRLS) Log Run Information:

Log Run	7	8	9	10	11 Repeat
Date	07/24/08	07/24/08	07/24/08	07/24/08	07/24/08
Logging Engineer	Pearson	Pearson	Pearson	Pearson	Pearson
Start Depth (ft)	31.0	36.0	41.0	35.0	37.0
Finish Depth (ft)	35.0	40.0	43.5	40.0	39.0
Count Time (sec)	300	20	300	300	300
Live/Real	R	R	R	R	R
Shield (Y/N)	N	N	N	Y (internal)	Y (internal)
MSA Interval (ft)	1.0	1.0	1.0	1.0	0.5
Log Speed (ft/min)	N/A	N/A	N/A	N/A	N/A
Pre-Verification	AC193CAB	AC193CAB	AC193CAB	AC193CAB	AC193CAB
Start File	AC193000	AC193005	AC193010	AC193014	AC193020
Finish File	AC193004	AC193009	AC193013	AC193019	AC193024
Post-Verification	AC193CAA	AC193CAA	AC193CAA	AC193CAA	AC193CAA
Depth Return Error (in.)	N/A	N/A	- 0.5	N/A	+ 0.5
Comments	No fine gain adjustment made.	No fine gain adjustment made.	No fine gain adjustment made.	No fine gain adjustment made.	No fine gain adjustment made.

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 Repeat
Date	07/24/08	07/24/08
Logging Engineer	Pearson	Pearson
Start Depth (ft)	0.0	0.0
Finish Depth (ft)	43.75	43.75
Count Time (sec)	15	15
Live/Real	R	R
Shield (Y/N)	N	N
MSA Interval (ft)	0.25	0.25
Log Speed (ft/min)	N/A	N/A
Pre-Verification	AM021CAB	AM021CAB
Start File	AM021000	AM021176
Finish File	AM021175	AM021196
Post-Verification	AM021CAA	AM021CAA
Depth Return Error (in.)	N/A	0
Comments	None	None

Passive Neutron Logging System (PNLS) Log Run Information:

Log Run	5	6 Repeat
Date	07/24/08	07/24/08
Logging Engineer	Spatz	Spatz
Start Depth (ft)	0.0	35.0
Finish Depth (ft)	43.0	40.0
Count Time (sec)	60	15
Live/Real	R	R
Shield (Y/N)	N	N
MSA Interval (ft)	1.0	1.0
Log Speed (ft/min)	N/A	N/A
Pre-Verification	AM022CAB	AM022CAB
Start File	AM022000	AM022044
Finish File	AM022043	AM022064
Post-Verification	AM022CAA	AM022CAA
Depth Return Error (in.)	N/A	- 1.0
Comments	None	None

Logging Operation Notes:

Measurements are referenced to the ground surface.

Analysis Notes:

Analyst:	Henwood	Date:	08/04/08	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging systems were performed before and after each day's data acquisition. The acceptance criteria were met.

A casing correction for a 9/16-in.-thick steel casing was applied to the SGLS and HRLS data. NMLS data are corrected to volumetric moisture according to calibration for 6-in. ID boreholes. PNLS data are used qualitatively and are reported in cps.

SGLS and HRLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with EXCEL worksheet templates identified as G1NMar08.xls and G1cNov07 for the SGLS and HRLS, respectively, using efficiency functions and corrections for casing, dead time, shielding as determined from annual calibrations.

In areas where dead time is greater than 40 percent, HRLS data are substituted for the SGLS data. Where HRLS data exceed 40 percent dead time, HRLS data acquired with an internal tungsten shield are substituted.

Results and Interpretations:

Cs-137 was measured at 3 and 4 ft at approximately 1 pCi/g and from 25 ft to the bottom of the borehole at 43.5 ft. The maximum concentration is measured at approximately 20 million pCi/g at 38 ft.

NMLS and PNLS data appear to be influenced by the highest gamma activity from approximately 36 to 40 ft. It is known this detector can be influenced by high gamma activity at Cs-137 concentrations in excess of 100,000 pCi/g. Therefore, counts acquired from the PN data between 36 and 40 ft were subtracted from counts acquired with the NMLS at the same depths prior to correcting for volumetric moisture. It is interpreted that the relatively high neutron flux at these depths is neither representative of enhanced moisture nor an indicator of alpha emitting radionuclides such as Pu-239.

All repeat data indicate good repeatability.

List of Log Plots:

Depth Reference is ground surface

Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Passive Neutron & Moisture
Cs-137 Repeat Section
Repeat Section of Natural Gamma Logs

[1] GWL – groundwater level
[2] TOC – top of casing

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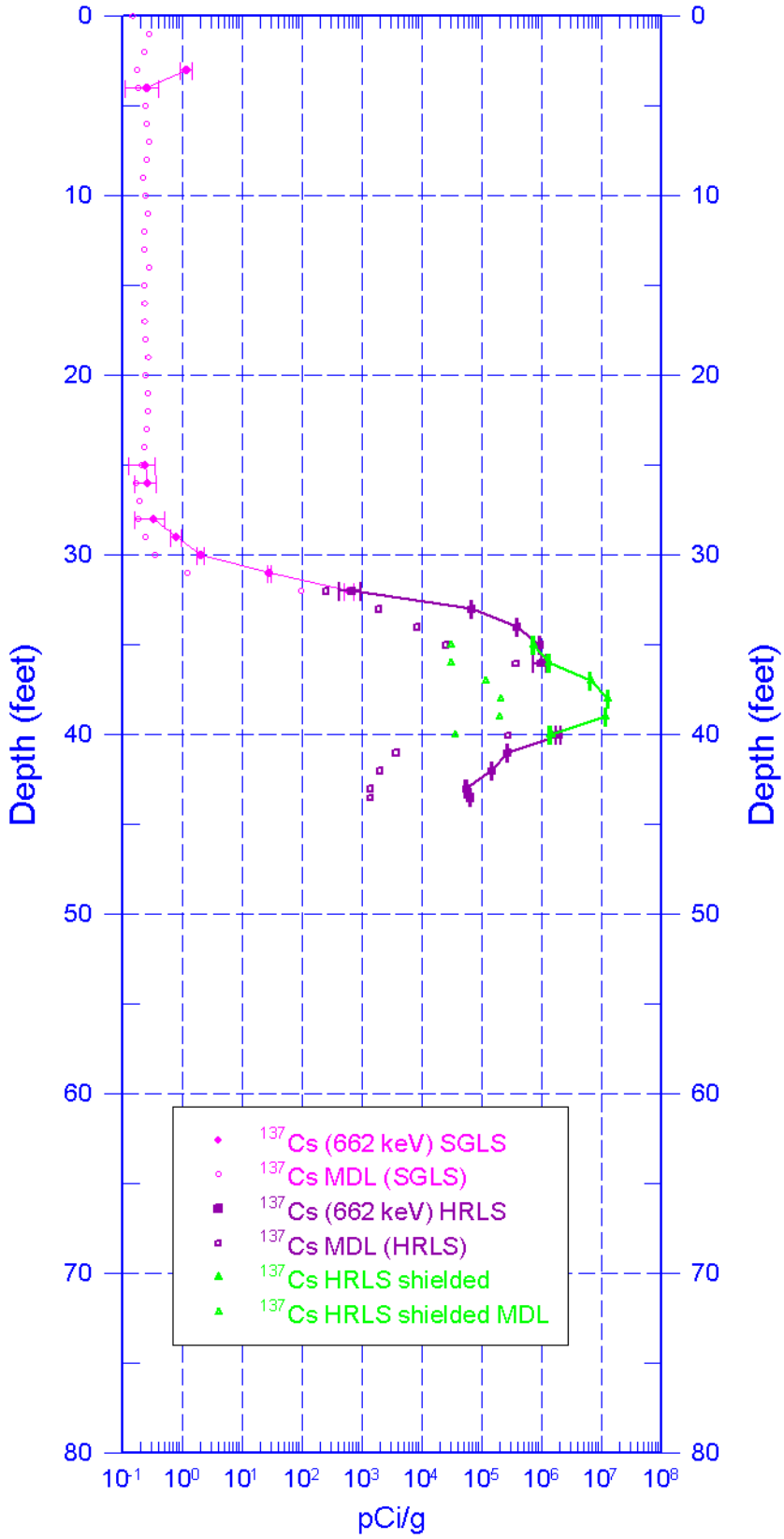
Manmade Radionuclides



Zero Reference - Ground surface

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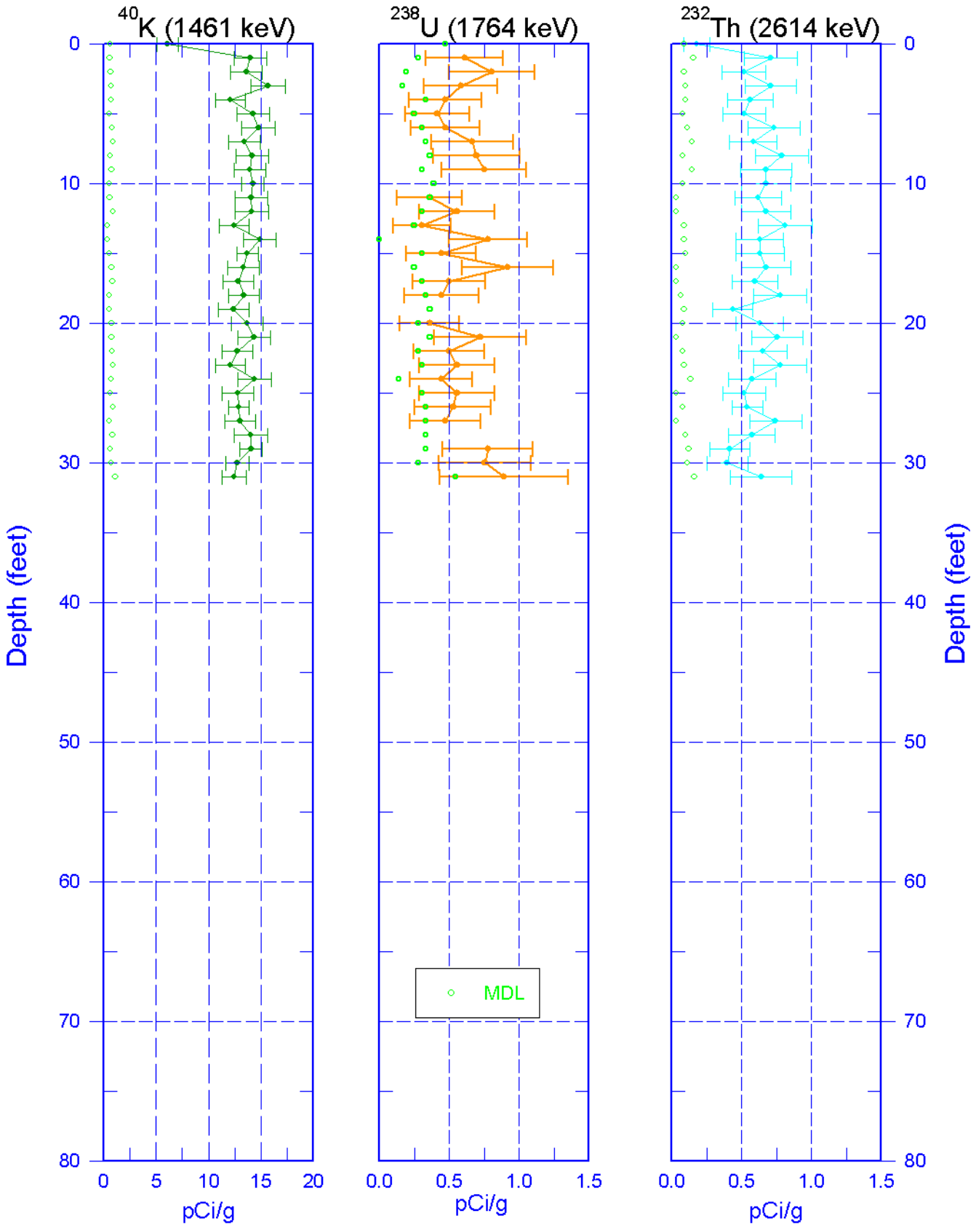
C6835
Natural Gamma Logs



Zero Reference - Ground surface

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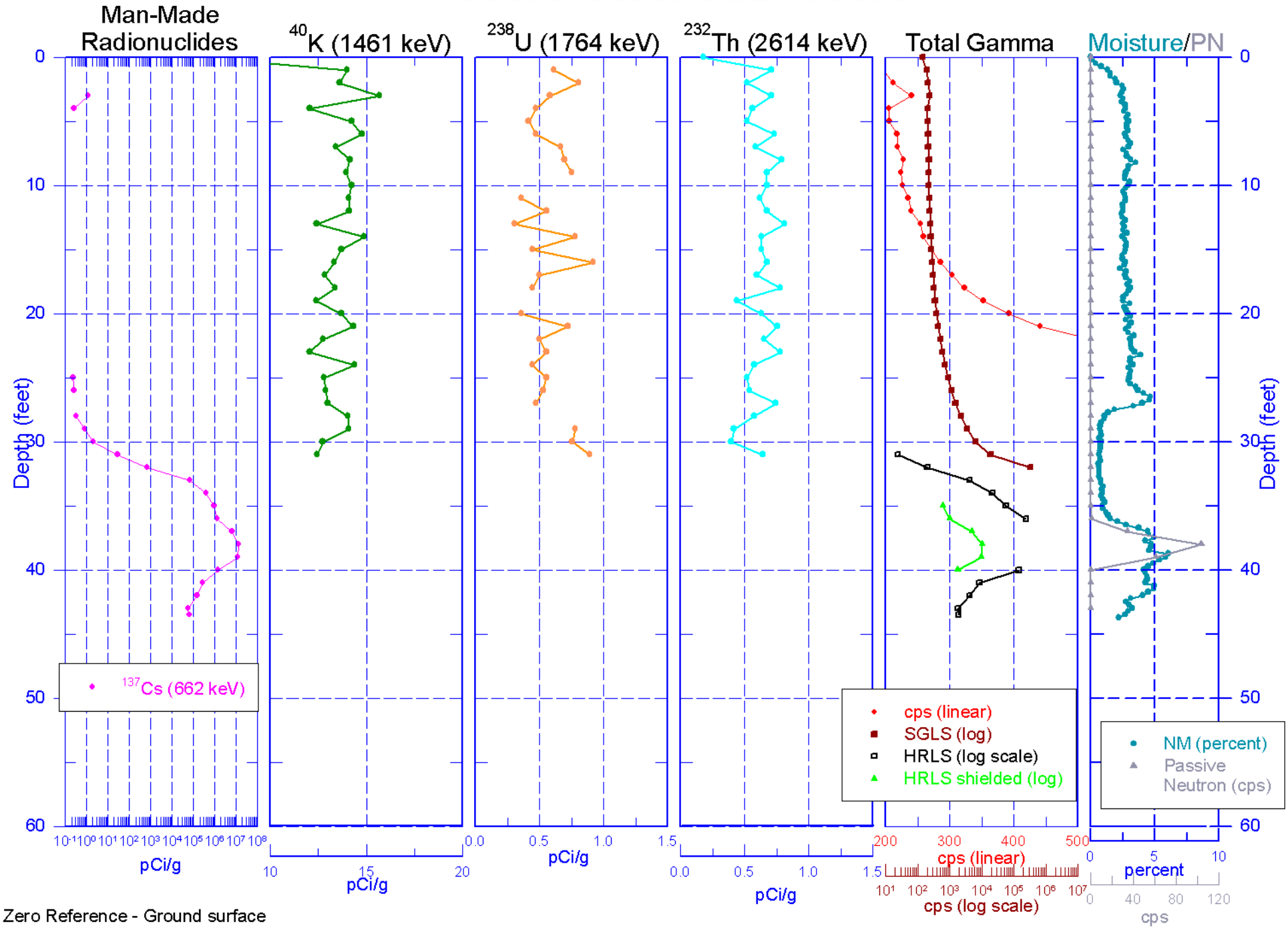
C6835 Combination Plot



Zero Reference - Ground surface

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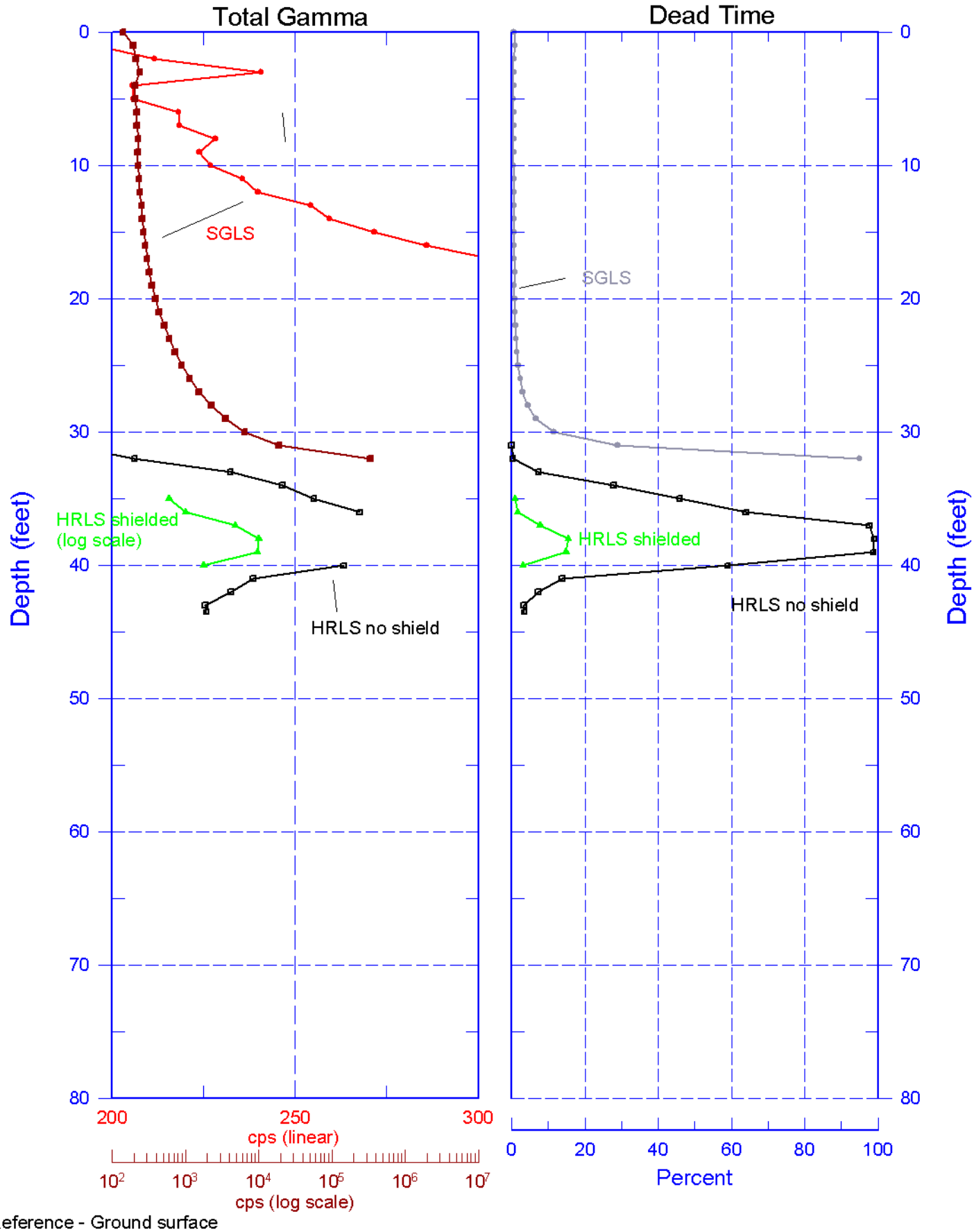
C6835
Total Gamma & Dead Time



Reference - Ground surface

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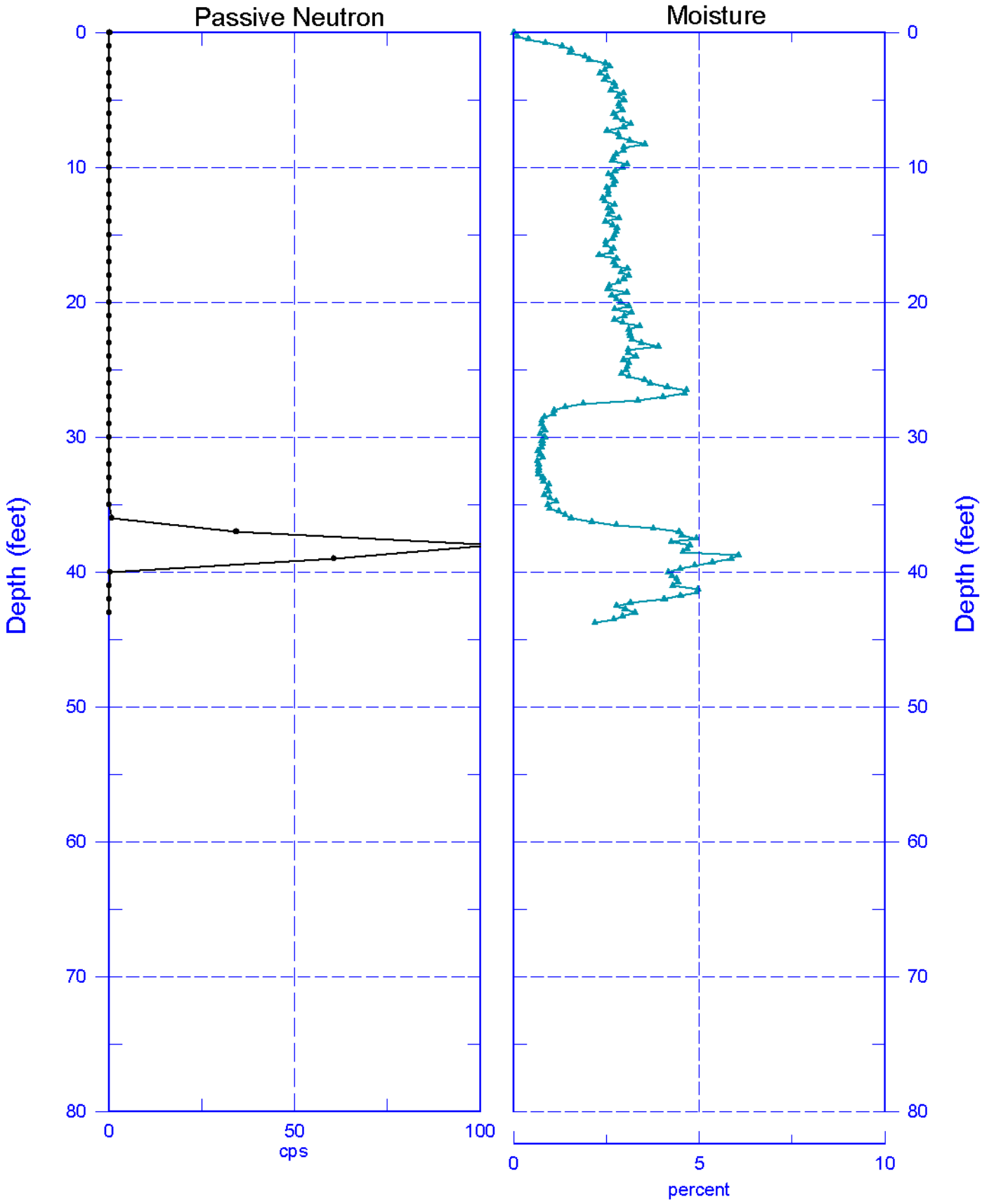
Passive Neutron & Moisture



Reference - Ground surface

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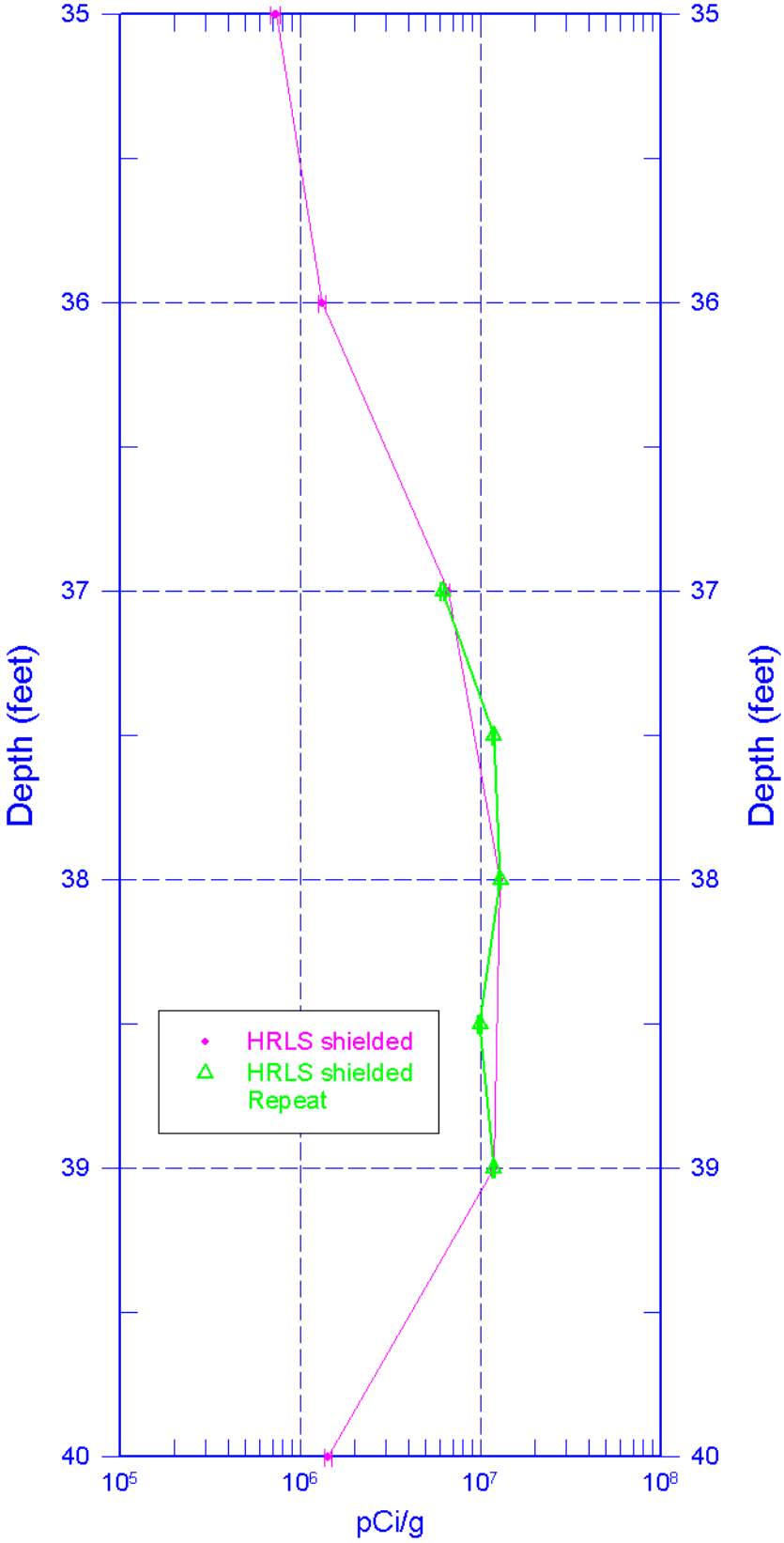
Cs (662 keV) Repeat Section



Zero Reference - Ground surface

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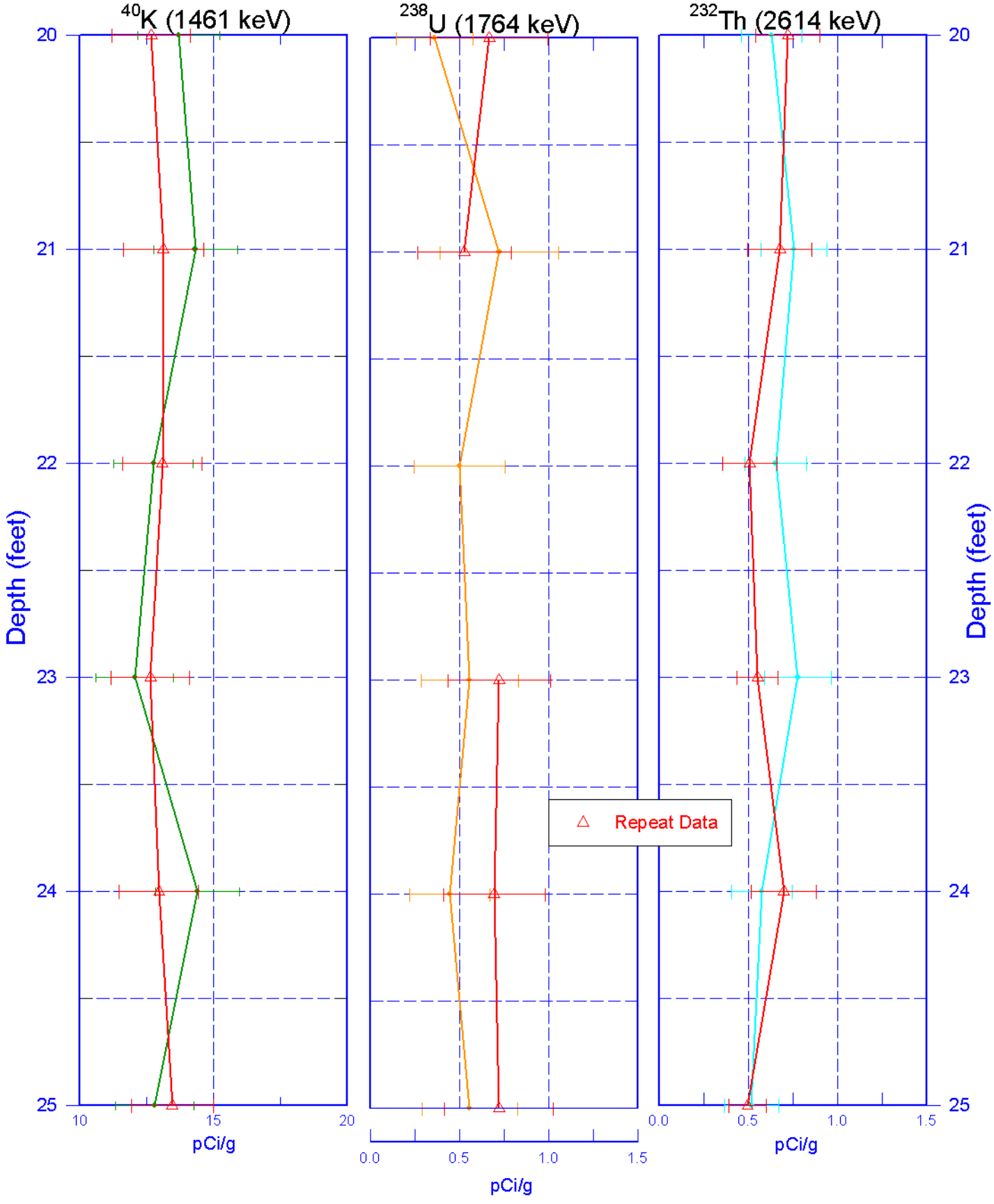
Repeat Section of Natural Gamma Logs



Zero Reference - Ground surface